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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/841,932	04/25/2001	Hiroyasu Takahashi	JP920000039US1	6599

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EXAMINER	
TABATABAI, ABOLFAZL	
ART UNIT	**PAPER NUMBER**
2625	

DATE MAILED: 04/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/841,932	TAKAHASHI, HIROYASU	
	Examiner	Art Unit	
	Abolfazl Tabatabai	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 April 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 April 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *7*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-4 and 6-11, and 13-18are rejected under 35 U.S.C. 103(a) as being unpatentable over Mutoh et al (U S 6,630,210 B1) in view of Kotani (U S 4,841,374).

Regarding claim 1, Mutoh discloses an image processing method comprising the steps of:

dividing an inputted image into pixel groups, each of which has a specified size (column 18, lines 46-55 and column 21, lines 47-65);

calculating a pixel group density for each of the divided pixel groups (column 26, lines 28-58);

calculating an output value of a certain watched pixel based on an absolute density of the watched pixel (column 45, lines 15-36).

However, Mutoh is silent about the specific details regarding a relative density for the watched pixel, the relative density being calculated based on the pixel group density of the pixel group, to which the watched pixel belongs, and the pixel group density of the pixel group adjacent to the pixel group, to which the watched pixel belongs, among the pixel groups in the image.

In the same field " image processing" of endeavor, however, Kotani discloses image processing system comprising a relative density for the watched pixel (column 4, lines 17-23), the relative density being calculated based on the pixel group density of the pixel group, to which the watched pixel belongs, and the pixel group density of the pixel group adjacent to the pixel group, to which the watched pixel belongs, among the pixel groups in the image (column 3, lines 6-13).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use calculating a relative density as taught by Kotani in the system of Mutoh because Kotani provides Mutoh a system which eliminates both granular noise and noise derived from a soiled surface of an original. The gradation is corrects in a wide density variation range to reproduce a high-contrast image without causing a reduction of the image sharpness.

Regarding claim 2, Mutoh discloses the image processing method wherein the step of dividing an inputted image into the pixel groups is meshing the image into sub images, each of which has a rectangular area (column 22, lines 56-67).

Regarding claim 3, Mutoh discloses the image processing method wherein the relative density is calculated by use of an influence degree calculated based on a distance from the watched pixel and the pixel group, to which the watched pixel belongs, to the pixel group adjacent to the pixel group, each of the adjacent pixel group being located on and under and at the right and left of the pixel group (column 8, lines 28-34 and column 9, lines 54-67).

Regarding claim 4, Mutoh discloses the image processing method wherein in the step of calculating the pixel group densities (column 26, lines 28-50 and column 28, lines 1-12), an average density of the divided pixel group is calculated, and the relative density is obtained by multiplying the respective average densities of the pixel group, to which the watched pixel belongs, and of the pixel group adjacent to the pixel group, to which the watched pixel belongs, by the respective influence degrees (column 35, lines 10-22).

Regarding claim 6, Mutoh discloses the image processing method wherein in the step of calculating an output value, the relative and absolute densities are weighted to calculate the output value (column 12, lines 44-59).

Regarding claim 7, Mutoh discloses a relative density detecting method for detecting a relative density of a watched pixel constituting an inputted image, comprising the steps of:

dividing the image into pixel groups, each of which has a specified size (column 18, lines 46-55 and column 21, lines 28-58);

detecting a pixel group density for each of the divided pixel groups (column 8, lines 28-34);

extracting positional information for the watched pixel in a pixel group including the watched pixel (column 25, lines 12-24).

However, Mutoh is silent about the specific details regarding the step of:

detecting a relative density of the watched pixel based on the pixel group density and the positional information.

In the same field " image processing" of endeavor, however, Kotani discloses image-processing system comprising the step of:

detecting a relative density of the watched pixel based on the pixel group density and the positional information (see abstract and column 4, lines 35-44).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use detecting a relative density of watched pixel as taught by Kotani in the system of Mutoh because Kotani provides Mutoh a system which eliminates both granular noise and noise derived from a soiled surface of an original. The gradation is corrects in a wide density variation range to reproduce a high-contrast image without causing a reduction of the image sharpness.

Regarding claim 8, Mutoh discloses an image processing apparatus comprising:

pixel group dividing means for dividing an inputted image into pixel groups, each of which has a specified size (column 18, lines 46-55 and column 21, lines 28-58);

pixel group density detecting means for detecting a pixel group density for each of the pixel groups divided by the pixel group dividing means (column 8, lines 28-34);

weight deciding means for deciding each weight of the pixel groups adjacent to the pixel, to which a watched pixel belongs, based on a position of the watched pixel to be outputted (column 12, lines 44-54).

However, Mutoh is silent about the specific details regarding the steps of:

watched pixel density detecting means for detecting a density of the watched pixel; and,

relative density calculating means for calculating a relative density of the

watched pixel based on a detected density of the watched pixel, a pixel group density of the detected pixel group and a decided weight of the pixel group.

In the same field " image processing" of endeavor, however, Kotani discloses image processing system comprising the steps of:

watched pixel density detecting means for detecting a density of the watched pixel (column 4, lines 35-44); and,

relative density calculating means for calculating a relative density of the watched pixel based on a detected density of the watched pixel, a pixel group density of the detected pixel group and a decided weight of the pixel group (column 3, lines 6-13).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use detecting relative density and calculating a relative density as taught by Kotani in the system of Mutoh because Kotani provides Mutoh a system which eliminates both granular noise and noise derived from a soiled surface of an original. The gradation is corrects in a wide density variation range to reproduce a high-contrast image without causing a reduction of the image sharpness.

Claim 9, is similarly analyzed as claim 8 above.

Regarding claim 10, Mutoh discloses the image processing apparatus wherein the pixel group dividing means roundly divides an inputted image into meshes, each of which has I pixels. times. j pixels (I, J: integers) (column 9, lines 33-38).

Regarding claim 11, Mutoh discloses the image processing apparatus wherein the weight deciding means comprises a table look-up for deciding weights of pixel

groups adjacent to a pixel group, to which the watched pixel belongs, based on a coordinate position of the watched pixel, the pixel groups being located at the right and left of the pixel group, to which the watched pixel belongs, and/or on and under the pixel group, to which the watched pixel belongs (column 34, lines 21-28).

Regarding claim 13, Mutoh discloses an image processing apparatus for converting image data, which includes a specified object photographed by a digital camera, into a binarized image, comprising:

a meshing unit for meshing the entire image data into sub images (column 2, lines 1-8);

an average density detection unit for detecting an average density of each of the sub images meshed by the meshing unit (column 28, lines 1-21); and a density detection unit for detecting a density of a pixel constituting the object, wherein a binarized image, in which an outline of the object is emphasized, is generated based on a detected density of the pixel, an average density of the sub image, to which the pixel belongs, and an average density of the sub image adjacent to the certain sub image (column 34, lines 43-54).

Regarding claim 14, Mutoh discloses an article of manufacture comprising a computer usable medium having computer readable program code means embodied therein for causing image processing, the computer readable program code means in said article of manufacture comprising computer readable program code means for causing a computer to effect the steps of claim 1 (column 49, lines 1-9 and 57-65).

Regarding claim 15, Mutoh discloses an article of manufacture comprising a computer usable medium having computer readable program code means embodied therein for causing relative density detection, the computer readable program code means in said article of manufacture comprising computer readable program code means for causing a computer to effect the steps of claim 7(column 49, lines 1-9 and 57-65).

Regarding claim 16, Mutoh discloses a program storage device readable by machine, tangibly embodying a program of instructions executable by the machine to perform method steps for causing image processing, said method steps comprising the steps of claim 1(column 49, lines 1-9 and 57-65).

Regarding claim 17, Mutoh discloses a program storage device readable by machine, tangibly embodying a program of instructions executable by the machine to perform method steps for causing relative density detection, said method steps comprising the steps of claim 7(column 49, lines 1-9 and 57-65).

Regarding claim 18, Mutoh discloses a computer program product comprising a computer usable medium having computer readable program code means embodied therein for causing image processing, the computer readable program code means in said computer program product comprising computer readable program code means for causing a computer to effect the apparatus of claim 8(column 49, lines 1-9 and 57-65).

Allowable Subject Matter

3. Claims 5 and 12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Other prior art Cited

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Toyada et al (U S 6,507,415 B1) disclose image processing device and image processing method.

Renaud et al (U S 6,167,154) disclose image processing apparatus and secondary feature indicative value calculating device.

Al-Houssein (U S 5,761,344) disclose image pre-processor for character recognition system.

Asada (U S 5,680,477) discloses system method and apparatus for converting image signal representing image having gradation.

Contact Information

5. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to ABOLFAZL TABATABAI whose telephone number is (703) 306-5917.

The Examiner can normally be reached on Monday through Friday from 9:30 a.m. to 7:30 p.m. If attempts to reach the examiner by telephone are unsuccessful, the Examiner's supervisor, Mehta Bhavesh M, can be reached at (703) 308-5246. The fax phone number for organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Abolfazl Tabatabai
Patent Examiner
Group Art Unit 2625
April 9, 2004

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